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ANNALS  
OF THE  
AMERICAN ACADEMY  
OF  
POLITICAL AND SOCIAL SCIENCE.

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THE GROWTH OF GREAT CITIES IN AREA AND  
POPULATION.

The growth of urban population during the past century in Europe and the United States has been so marked as to excite the universal attention of students of our social, industrial and political conditions. Not only has the population living in cities increased enormously in absolute numbers during the last hundred years throughout the world affected by European civilization; but the proportion of the total population dwelling in cities has increased in almost as remarkable a manner. This is true no matter how we define the expression urban population, so long as we give a reasonable sense to the term.

The United States forms a striking example of this development. Owing to the enormous extent of its unoccupied and unsettled territory, and the rapid rate at which it has occupied the wilderness, we should have expected to find simply this tendency to diffusion, but parallel with it has gone a tendency to concentrate in cities. The following table shows the growth of urban population from 1790 to 1890:

GROWTH OF URBAN POPULATION IN THE UNITED STATES FROM  
1790-1890.\*

Census years.	Population of the United States.	Population of cities having 8000 or more inhabitants.	Percentage of the popula- tion in such cities to the total popula- tion.	Number of cities of 8000 or more in- habitants.
1790 . . . . .	3,929,214	131,472	3.35	6
1800 . . . . .	5,308,483	210,873	3.97	6
1810 . . . . .	7,239,881	356,920	4.93	11
1820 . . . . .	9,633,822	475,135	4.93	13
1830 . . . . .	12,866,020	864,509	6.72	26
1840 . . . . .	17,069,453	1,453,994	8.52	44
1850 . . . . .	23,191,876	2,897,586	12.49	85
1860 . . . . .	31,443,321	5,072,256	16.13	141
1870 . . . . .	38,558,371	8,071,875	20.93	226
1880 . . . . .	50,155,783	11,318,547	22.57	286
1890 . . . . .	62,622,250	18,284,385	29.20	448

It will be noted that in the above table only that population is counted as urban which is to be found in cities of 8000 inhabitants or upwards. To accept the number 8000 as marking the limit of urban population is certainly an arbitrary choice, and the figure is one which on the whole is much too high, since people are living under practically urban conditions as distinct from rural in much smaller communities than those of 8000. But owing to the manner in which previous censuses have been taken, this is the figure for which we have most easy and definite comparisons. A glance at the table shows the percentage of urban population to the total population to have risen from a little over 3 per cent in 1790 to nearly 30 per cent in 1890.†

In order to determine, however, the real urban population we may properly take a much lower figure than 8000. The census of 1890 showed 905 places with a population of 4000 and over, containing 20,799,296 people, or 33.21 per cent of

\* "Report on the Population of the United States at the Eleventh Census," 1890, Part I. Washington, 1895. Pp. lxxv et seq.

† See "A Model City Charter," by Edmund J. James. Publications of National Municipal League, Philadelphia.

the total population of the country. If we take the figure somewhat lower, namely, 2500, we find that in 1890 there were 1522 places with such a population, having a combined population of 22,717,465, representing 36.28 per cent of the population.\* If we count as urban the places with a still smaller population, namely, 1000 or more, it appears, according to the census of 1890, that there were 3715 places in the United States within this category having a total population of 26,109,074, or 41.69 per cent of the total population of the United States.†

A remarkable phenomenon in this connection is the growth of cities in the more sparsely settled states. The appearance of such urban agglomerations as Minneapolis and St. Paul, Omaha, Kansas City, etc., in what are chiefly agricultural states, is one of the most striking facts of our social life. The three Pacific States, with a remarkably sparse population on the whole, showed in 1890 a population of 901,644 in cities of 8000 or more inhabitants, while the rest of the population, rural and village together, only amounted to 969,643. A similar state of things exists in Australia, where a still larger per cent of the population live in cities of over 8000 inhabitants than in the United States.‡

The total population of the United States increased in the decade from 1880 to 1890 by 12,466,467, or almost exactly 25 per cent (24.86 per cent). The urban population, counting as urban the places having 1000 or more inhabitants, showed an increase of 8,366,949, *i. e.*, an increase of 47.07 per cent, while the rural population, meaning by that the population of all places containing less than 1000, showed an increase of only 4,099,518, or 12.66 per cent. That is to say, the increase in the towns of 1000 and more inhabitants was absolutely more than twice as great as in all other

\* "Compendium of the Eleventh Census," Part I, p. 442. Washington, 1892.

† *Ibid.*, p. 453.

‡ "Growth of Cities in the United States during the Decade 1880-1890," by Carl Boyd. Publications of the American Statistical Association, Vol. iii (1893), p. 416.

places, while relatively it was nearly four times as great, and this in spite of the fact that in certain portions of the country, as notably in New England, the population of the smaller towns had nearly uniformly shown a decrease. Thus in the aggregate, the towns of Massachusetts having less than 2000 inhabitants in 1890 (179 in number) had a smaller population in that year than in 1820, seventy years before.\*

A similar tendency to that which has shown itself in the United States has revealed itself also in other countries, notably in England, France and Germany. Taking the population of the so-called urban sanitary districts in England as urban in character, the following table shows the urban population of England by classes of districts in 1891, and also the percentage of increase from 1881 to 1891.†

URBAN POPULATION IN ENGLAND.

Population of Districts.	Number of Districts.	Aggregate population of Districts, 1891.	Percentage of entire population, 1891.	Percentage of increase, 1881-1891.
250,000 and upwards . . . . .	6	6,375,645	22.0	9.1
100,000-250,000 . . . . .	18	2,793,625	9.6	19.1
50,000-100,000 . . . . .	38	2,610,976	9.0	22.9
20,000- 50,000 . . . . .	120	3,655,025	12.6	22.5
10,000- 20,000 . . . . .	176	2,391,076	8.3	18.9
3,000- 10,000 . . . . .	453	2,609,141	8.9	9.6
Under 3,000 . . . . .	195	367,282	1.3	2.6
Total Urban . . . . .	1,006	20,802,770	71.7	15.3
“ Rural . . . . .	. . . . .	8,198,248	28.3	3.4
Total population . . . . .	. . . . .	28,001,018	100.0	11.65

From these figures it appears that in 1891 22 per cent of the population of England and Wales lived in six towns of upwards of 250,000 inhabitants; 31.6 per cent lived in

\* "Decrease of Rural Population," John C. Rose, *Popular Science Monthly*, Vol. xlii (1892), p. 621. Also, "Statistics and Sociology," by Richmond Mayo-Smith, p. 369.

† "Statesman's Yearbook." 1897. p. 19.

twenty-four towns of over 100,000 inhabitants; 40.6 per cent in sixty-two towns of over 50,000 inhabitants; 53.2 per cent in 182 towns of over 20,000 inhabitants, and 61.5 per cent in 358 towns of over 10,000 inhabitants. It also appears that, while the increase of the total urban population was more than 15 per cent in the decade from 1881 to 1891 (15.3), the increase of the rural population was less than 4 per cent (3.4), the increase being over four and one-half times as rapid in the total urban as in the rural districts.

France shows the same tendency, especially during the last fifty years. Taking the communes with a population of over 2000 as the basis of the urban population, the following table shows the percentage of the urban population in France to the total population by five year periods, from 1846 to 1891:

GROWTH OF URBAN POPULATION IN FRANCE, FROM 1846-1891.\*

	Per cent of Urban to Total Population	Per cent of Rural to Total Population.
1846 . . . . .	24.42	75.58
1851 . . . . .	25.52	74.48
1856 . . . . .	27.31	72.69
1861 . . . . .	28.86	71.14
1866 . . . . .	30.46	69.54
1872 . . . . .	31.06	68.94
1876 . . . . .	32.44	67.56
1881 . . . . .	34.76	65.24
1886 . . . . .	35.95	64.05
1891 . . . . .	37.4	62.6

In fact, almost the entire increase in population in France of late years has taken place in the cities, the rural population, as a whole, having absolutely declined. Thus from 1886 to 1891 the total population of France increased by

\* "Statistique générale de la France." *Résultats statistiques du Dénombrement de 1891*. Paris, 1894. p. 65.

124,289 souls, but the population of cities having over 30,000 inhabitants increased in the aggregate by 372,074; Paris alone by 103,407.\* The rural population, estimated on the basis given in the above table, declined by 450,000 souls. The following table shows the population of the Department of the Seine (Paris and its suburbs), having a total area of 185 square miles,† compared with that of the political Paris for certain periods between 1800 and 1896:

	Greater Paris.	Political Paris.
1800 . . . . .	630,585	547,756
1831 . . . . .	935,108	785,862
1851 . . . . .	1,422,065	1,053,262
1872 . . . . .	2,220,060	1,851,792
1881 . . . . .	2,799,923	2,239,928
1891 . . . . .	3,141,595	2,447,957
1896 . . . . .	3,340,514	2,536,834‡

This table shows in the course of ninety years over a five-fold increase, while the population of the nation as a whole has not nearly doubled, increasing from 27,349,003 in 1801 to 38,343,192 in 1891, or in the ratio of 100 to 140. In the five years from 1891 to 1896 the total population of France increased by 175,027, but the population of cities over 30,000 increased by 327,009, showing again a positive decrease in the population outside of cities of over 30,000.§

In Germany the same tendency is revealed as in the other countries mentioned before. Taking the places with a population of 2000 or more as urban, the following table

\* "Dénombrement de la Population, April 12, 1891." Paris, 1892. p. 829.

† "Annuaire Statistique de la France." Vol. xvii (1897). p. 7.

‡ "Dénombrement de la Population pour 1896." Paris, 1897.

§ See (1) Sedlacek, "Die Bevölkerungszunahme der Grosstädte im XIX Jahrhundert und deren Ursachen." "Report of the Eighth International Congress of Hygiene and Demography, held at Budapest September 1-9, 1894." Budapest, 1896. pp. 358 et seq.

(2) Levasseur, "La Population Française." Paris, 1891. Vol. ii, pp. 338 et seq.

(3) Maurice Block. "Statistique de la France." Paris, 1874. pp. 34 et seq.

(4) "Annuaire de l'économie politique et de la statistique." Paris 1844 and following years.

(5) Bulletin de Statistique et de Législation comparée. Vol. xlii (1897). p. 78.

(6) Journal de la Société de Statistique de Paris. Vol. xi, quoted in Sedlacek.

shows the growth of urban population within the limits of the present German empire from 1871 to the present. The cities are divided into four classes as indicated in the tables below:

THE NUMBER OF CITIES IN THE GERMAN EMPIRE, 1871-90.

Classes.	1871	1875	1880	1885	1890
1. Large cities, 100,000 and more	8	12	14	21	26
2. Middle cities, 20,000-100,000	75	88	102	116	135
3. Small cities, 5000-20,000 . . .	529	591	641	683	733
4. Rural cities, 2000-5000 . . . .	1761	1837	1950	1951	1997
	2373	2528	2707	2771	2891

POPULATION OF THE CITIES BY CLASSES.

Classes.	1871	1875	1880	1885	1890
1. Large cities, 100,000 and more . . . .	1,968,537	2,665,914	3,273,144	4,446,381	5,995,972
2. Middle cities, 20,000-100,000 . . . .	3,147,272	3,487,857	4,027,085	4,171,874	4,824,754
3. Small cities, 5000-20,000 . . . .	4,588,364	5,124,044	5,671,325	6,054,629	6,480,192
4. Rural cities, 2000-5000 . . . . .	5,086,625	5,379,357	5,748,976	5,805,893	5,942,311
	14,790,798	16,657,172	18,720,530	20,478,777	23,243,229
5. Other places-rural districts . . . . .	26,219,352	26,070,188	26,513,531	26,376,927	26,185,241
	41,010,150	42,727,360	45,234,061	46,855,704	49,428,470

PERCENTAGE OF THE TOTAL POPULATION IN THE CITIES OF THE VARIOUS CLASSES.

Classes.	1871	1875	1880	1885	1890
1. Large cities, 100,000 and more	4.8	6.2	7.24	9.5	12.1
2. Middle cities, 20,000-100,000	7.7	8.2	8.9	8.9	9.7
3. Small cities, 5000-20,000 . .	11.2	12.	12.54	12.9	13.1
4. Rural cities, 2000-5000 . . .	12.4	12.6	12.71	12.4	12.
	36.1	39.	41.39	43.7	46.90+
5. Other places-rural districts	63.9	61.	58.61	56.3	52.96

This table shows that in the course of twenty years the number of cities in Germany having a population of



100,000 and more increased from eight to twenty-six; the total population within such cities from 1,968,537 to 5,995,972, and that while their aggregate population amounted to 4.8 per cent of the population of the empire in 1871, they made up 12.1 per cent in 1890. The following table shows the annual rate at which the urban population in cities of over 20,000 increased as compared with the total population of the empire by five-year periods from 1871 to 1895:\*

	1871-75	1875-80	1880-85	1885-90	1890-95
Rate of increase of total population . . . . .	1 per ct.	1.14	.70	1.07	1.11
Rate of increase of urban population (cities of 20,000) . . .	3.06	2.39	2.24	2.87	2.20

What is true of these four countries is true in a general way of Italy, Austria and Russia as well, and even of Spain.†

But it is not only true that the urban population, has increased both absolutely and relatively; but this is also true of the people living in the great cities, the enormous aggregates of population.‡ Indeed the growth of the great cities, meaning by that cities with a population of 200,000 and upwards, has been perhaps the most remarkable fact in this whole phenomenon of urban growth. One may truly call this century not only the age of cities, but also the age of great cities. It is interesting to note also that with few exceptions this enormously rapid rate of growth began rather in the latter half of the century.

The following table shows this tendency in a marked manner:

\* See *Vierteljahrsheft zur Statistik des deutschen Reichs*. Vol. v, 1896. No. II, pp. 114 et seq. Also, Vol. i, 1892, No. II, p. 29; also, *Statistik des deutschen Reichs*, Neue Folge, Vol. 32, 1888. "*Die Volkszählung im deutschen Reich am 1 December*," 1885.

† See Georg v. Mayr, "*Die Bevölkerungsstatistik*." Freiburg, 1897.

‡ See Sedlaczek *op. cit.*

City.	Population with which Compared.	Year.	Per cent of Total Population	Year.	Per cent of Total Population
Berlin . . .	German Empire	1820	.76	1890	3.20
Paris . . .	France . . . .	1840	2.73	1891	6.32
Vienna . . .	Lower Austria .	1840	27.41	1890	51.27
Chicago . . .	United States .	1840	.03	1890	1.76
Philadelphia	" "	1800	.78	1890	1.67
London . . .	England&Wales	1801	10.78	1891	14.52
Budapest . .	Hungary . . . .	1840	.94	1890	3.25
Glasgow . . .	Scotland . . . .	1801	4.80	1891	14.10
Hamburg . . .	German Empire	1820	.43	1890	1.14
Brooklyn . .	United States .	1800	.04	1890	1.29
Dresden . . .	German Empire	1820	.20	1890	.56
Leipzig . . .	" "	1820	.14	1890	.59
Munich . . .	" "	1820	.20	1890	.70

The group of cities of 100,000 inhabitants seems in all countries to have increased relatively more rapidly than the smaller cities. There seems to be a tendency, it is true, in the last few years toward a relatively slower growth of the great centres. Sedlacek calls attention to this fact in the article referred to before.\* He says that while the population of the great cities comprises from decade to decade an increasing percentage of the total population of the countries within which they are situated, it does not appear that the attractiveness and rate of growth of a city increases in proportion to its size as some have maintained, at least so far as this is revealed by the mere percentage of increase in the population. Boyd, in the article referred to before,† calls attention to the fact that the highest rate of growth showed itself in the case of cities having a population of from 75,000 to 100,000, the increase being 91.25 per cent. Cities with a population of from 60,000 to 200,000 increased at the rate of 63.07 per cent, while those with a population of over 200,000 showed a rate of increase of only 36 per cent. The later censuses seem also to bear out the idea that a slower rate

\* See also "London Statistics, 1896-97." Publications of London County Council, Vol. vii, p. x, 1898.

† "Growth of Cities in the United States," p. 416.

of growth has begun for these enormous aggregates of population, but we cannot infer this too definitely without a close examination of the facts relating to the territorial increase of such cities, and to the growth of their suburbs, facts which are rarely considered in the reports. At any rate it must be allowed that for the latter half of the century as a whole this relative increase of the larger aggregates of population is one of the striking factors.

Although these facts are commonplaces to which the attention of intelligent persons has been called again and again, it is doubtful whether, after all, the general public realizes fully the true significance of these facts for our social, industrial and political future. Indeed, it is doubtful whether we fully realize even the plain simple facts themselves, to say nothing of the deeper meaning which reveals itself upon a closer investigation and analysis. This is perhaps owing, among other things, to defective methods of presenting the facts in regard to this development. Our statistical tables, as ordinarily prepared and published, do not present the facts in such a way as to bring home to the public consciousness their absolute or relative importance. This arises from a multitude of circumstances, some of which will be discussed more fully later. It will be sufficient here to refer to one or two of them for the purpose of making plain what is meant. In the ordinary tables of the population of great cities we find the cities arranged in a certain order according to population. Thus if we were to take the tables prepared upon the basis of the census returns collected in the various countries from 1890 to 1895, we should find Registration London put down with a population in 1891 of 4,211,056, and March 29, 1896, of 4,411,271; New York, with a population in 1890 of 1,515,301; Chicago, in 1890, with a population of 1,099,850; Paris, 1891, with a population of 2,424,705; Berlin, 1890, with a population of 1,579,542.†

† Sedlacek, *op cit.*

Now the merest glance at such a table as this on the part of one familiar with the facts shows that it fails to give the person who reads it an adequate notion of the enormous aggregates of population which are to be found to-day in these centres. Thus London, which is put down with a population of a little over four millions, had, if we should give a large definition to it, a population a little in excess of six millions.\* New York, with a population of a million and a half in 1890, was the centre of an agglomeration dependent for its life and activities upon the city of New York, with a total population of nearly 3,000,000. The recent additions to the city have increased the census population to perhaps three and one-half millions.

New York is considered in the tenth census (1880)† as a metropolis, including the political units New York, Brooklyn, Jersey City, Newark and Hoboken. The growth of the Greater New York as compared with political New York is indicated in the following table:

	Population of the Metropolis.	Population of New York.
1790 . . . . .	34,734	33,131
1800 . . . . .	62,893	60,489
1810 . . . . .	100,775	96,373
1820 . . . . .	137,388	123,706
1830 . . . . .	220,471	197,112
1840 . . . . .	369,305	312,710
1850 . . . . .	660,803	515,547
1860 . . . . .	1,183,148	805,658
1870 . . . . .	1,546,293	942,292
1880 . . . . .	2,061,191	1,206,299
1890 . . . . .	2,710,125	1,515,301

It will be seen that by 1890 the population of the Greater New York had become nearly twice as large as that of the political New York.‡ Paris, Vienna and Berlin should

\* "London Statistics, 1896-97." Vol. vii, p. x.

† Volumes on "Social Statistics of Cities." Vol. i, p. 53r.

‡ See also the history of the growth of Boston and suburbs. Massachusetts Census, 1895. Vol. i, pp. 45 and 219.

certainly have their corresponding figures increased by from one-fifth to one-half, in order to convey an adequate idea of what these great cities have become. The following table shows the growth of the Greater Berlin from 1801 to 1895:

POPULATION OF BERLIN.\*

	1801	1875	1880	1885	1890	1895
Berlin (Political) . . .	173,440	966,858	1,122,330	1,315,287	1,578,794	1,677,304
Larger Berlin (area ten miles from mid- dle point) . . . . .	197,112	1,131,706	1,314,286	1,558,395	1,957,117	2,254,570

If we look in the ordinary table of population we shall find the city of Manchester put down in 1891 with a population of 505,368; and yet within an area of ten miles from the Guild Hall in Manchester there was probably at that time a population of over three millions. Now it is plain that from such tables one can derive no adequate idea even of the plain and simple facts in regard to these questions, and we are misled time and again in our estimates of what is reasonable and proper in the field of social and economic policy by depending upon such figures as these to give us the requisite basis for reasoning. Thus it seems an unreasonable proposition that a city of half a million of people, like Manchester, should invest \$75,000,000 and upwards in the construction of a ship canal for the purpose of making Manchester a seaport. It is impossible to believe that such an expenditure of public or private capital can be justified by the increase in facilities, and by the greater opportunities for development which such a project, if successfully carried out, may bring. But it is an entirely different proposition if, upon examination, we find that for all purposes of the canal it is to serve the wants of what is practically an urban district, taking somewhat larger limits than those given above of ten millions of people. In the

\* See "*Statistisches Jahrbuch der Stadt Berlin.*" Vol. xxi (1894). Berlin, 1896. p. 14 and Vol. xxii (1895). Berlin, 1897. For Paris and its suburbs (the Department of the Seine), see p. 6 of this paper.

same way the enormous expenditures of the city of Paris have a different significance and meaning and a different justification for a population of nearly four millions from what they have if you are considering a population of somewhat less than three millions. Likewise in the case of the city of Berlin; what seems perhaps extravagant and unjustified in connection with a population of a million and a half becomes only reasonable, or perhaps necessary, for a population of two and one-half millions, which is nearer the figures of the Greater Berlin.

These facts are of course recognized by students, but they are not always considered by those who have not the time to examine the details of such matters, and it is no uncommon thing even in the writings of persons who should know better to find arguments based upon these figures taken as they are, and as if they applied to something like the same thing.

The source of error in such reasoning arises from the fact that while we are ordinarily concerned in such discussions with social, or industrial, or economic phenomena or policies, we do not take the social, industrial, or economic unit as the basis of our discussion, but take instead an entirely different thing, namely, the political unit known as the city of London, of Paris, of Berlin, of New York. There would be, of course, little cause for error if as a matter of fact the political unit corresponded with reasonable accuracy to the social or industrial or economic unit. But this is true only in the case of comparatively few of the tables of population which have been constructed to show the growth of urban population in the modern world. It is true that within the last few years cities have shown a decided inclination to make their political boundaries correspond to some extent at any rate with their social, industrial, and economic boundaries. This is the real meaning of the marked tendency toward the increase of city areas, which has shown itself in the last twenty years in all civilized countries. It is rather remarkable

indeed that the extension of the boundaries of the cities have been long delayed,—in many cases, for a full generation after the economic and social conditions demanded an extension.

The history of these extensions is an extremely interesting one, and would well repay a detailed examination. Much ridicule has been thrown on the ambitions of cities in various portions of the world as revealed by their attempt to draw within the circle of their control the immediately adjacent territory. But in such a movement there are more powerful forces at work both to extend the limits of a city, and to prevent their extension than petty pride. Thus there is a very common tendency in recent times for many people who do business within a given centre to move outside the limits of the area controlled, politically speaking, by that centre. Ordinarily the rates of taxation are higher within the city than in the suburban districts, and an addition of a suburban district, while it may mean to the city an increasing expense in certain ways for laying out of streets, water mains, etc., means also an increased rate of tax for these new areas. Practical questions of this sort are liable to be determined largely by questions of local interest. Certain influences favor extension, other influences oppose it. The final outcome is nearly always a compromise entirely satisfactory to no one, and based as a rule on no principle.

But even as a theoretic question it is not easy to determine the point at which a given area adjacent to a city should be annexed and brought within the scope of municipal authority, and the question must undoubtedly be settled largely by local conditions.\* Thus it is plain that if a given suburban region is to be settled up rapidly, it lies in the interest of the city, and, in the long run, of the suburban region itself, that the area shall be added to the city soon enough in the history of its development so that the general scheme

\* See "Pamphlets Against Consolidation," Nos. 1-5. Published by League of Loyal Citizens. 44 Court St., Brooklyn, 1895.

of streets, of sewers and drainage, of water supply, the general school system, etc., can be easily harmonized and integrated with the existing system of the city.\* Otherwise a system of streets and a system of public services of various kinds may be worked out in the case of the suburban district which would require extensive and expensive alterations and sometimes indeed entire reconstruction and rebuilding in order to fit it into the plan of a great city. In some cases it is plainly to the interest of the suburban region, where local conditions are favorable, to keep out of the reach of city control and city taxation as long as possible, while it is plainly unfair in other instances that such adjacent regions should enjoy all the privileges of city life and be enabled to escape a large share of its burdens. So difficult is this problem of adjustment between the interests of suburban regions and the cities, that long periods have elapsed in the history of many of our great cities after the time when the suburban regions should have been annexed before it was possible to overcome the opposition of conflicting interests and bring about the adjustment which lay in the wider and larger interests of all. Philadelphia, before referred to, offers an excellent illustration of this fact.† Around the old city which had only an area of two square miles had grown up a series of suburban regions which, for all practical purposes, were portions of the city, each one to a large extent with its own scheme of local improvements, each one unwilling to yield its independence and fancied superiority for the sake of the larger welfare, and there is no doubt that the people of Philadelphia had to bear a larger additional burden of taxation for the purposes of reconstructing and readjusting and bringing into harmony these local differences than would have been necessary if the area of the city had been enlarged fifty years

\* See "*Die Einverleibung der Leipziger Vororte und ihre sozialpolitischen Wirkungen.*" Dr. Ernst Hasse, *Blätter für soziale Praxis*. 1894. Numbers 76-78.

† See "*The City Government of Philadelphia.*" With an Introduction by Edmund J. James. Philadelphia, 1893.



sooner to something like a reasonable point. As an instance of the inconveniences growing out of waiting to annex territory until it has developed a life and organization of its own, the history of annexations in the city of Chicago may be quoted. The sewage system, the water supply system, and the system of schools to some extent which grew up in the districts immediately surrounding the city were at many points so different from that of the city itself, that large reconstructions were necessary, involving great expense to all parties. Thus at one time there were twelve or fifteen different streets within the city having the same name; a circumstance growing out of the fact that the various suburban regions had duplicated in many instances the names of streets in the city. Annexation involved a renaming and a renumbering at the least, a comparatively small matter, but after all one involving considerable inconvenience.

For decades before 1890 strong efforts had been made in Vienna to bring about a political union between the old city and the numerous suburbs which had sprung up about it. The existence of an elaborate system of city customs duties upon various important articles of consumption introduced many complications into the problem. The suburbs did not wish to accept such a method of getting revenue while the old city declared it fundamental to a sound financial system. After long years of fruitless negotiation union was effected under pressure from the general government in 1889-90.\*

Ever since 1852 agitation had been going on looking to an extension of the boundaries of Leipzig, but it was not until 1889-90 that the negotiations reached a point where success was possible. The suburbs wished to join for some purposes, but not for others. They proposed many conditions, most of which had a tendency to thwart the very aim of consolidation and when the extension of the territory was

\* "*Die Gemeinde-Verwaltung der Stadt Wien in den Jahren 1889-1893.*" Vienna, 1895. p. 1.

finally made, it did not include by any means all the places contemplated at first.\*

The complex of different authorities to be found in many of our American cities is to be explained to some extent by the imperative necessity of securing a certain uniformity of treatment in regard to some of the larger elements, such as drainage and water supply over large areas, combined with the unwillingness of portions of this area to enter upon all the duties and obligations, as well as the privileges of the city portions of the area. In nearly all communities of the old world, and in many of our own, the unit of police administration, for example, has been made much larger than the city in the narrow sense with which it is associated, as it is claimed that no efficient police service can be built up within a city surrounded by suburban regions with essentially city characteristics, but without organic connection with the city itself. Thus the police area comprises in the case of the city of Berlin a much larger area than the city proper, and the same thing is true of other cities in Europe and the United States. In some instances a general scheme of water supply, or of drainage, or of fire service, has been adopted for the city and the suburban regions necessitating the creation of separate and to a large extent independent boards, leading to a division of authority, and to a working at cross purposes which can only result in inefficiency and enormously increased expense. The English system of the Metropolitan Board of Works, adopted in London, which was in operation for nearly fifty years, was a creation of this sort to carry out certain public services, which to be efficient must be carried out according to a common plan, and yet which could not, prior to 1890, be under the authority of the city of London, whose municipal authority did not cover so wide a territory.

These considerations may suffice to indicate at least the

\* See "*Verwaltungsbericht des Rathes der Stadt Leipzig für das Jahr 1893.*" Leipzig, 1895.

complexity and difficulty of this problem of annexation which has faced every modern city, and which perhaps nowhere is ever solved to the satisfaction of all parties.

It is plain also that for the same reason it is difficult to make thoroughly accurate comparisons between cities of different countries, or even the cities of the same country, in regard to many of the most important branches of the public service, owing to the fact that the statistics and reports kept by these cities do not cover the same body of facts or similar bodies of facts. Enough has been said perhaps to indicate the reason for the statement made at the outset that our statistical tables do not present the facts in such a way as to convey the impression of the real state of affairs to the mind of the reader. But it is worth while to stop a moment longer for the purpose of calling attention to some of the most common errors arising from these misleading comparative statements.

We have already referred to the fact that the ordinary population tables are misleading because they take the political unit instead of the real urban unit and thus give entirely false notions as to the real relative size of great cities. New York, London and Manchester were specially mentioned. Some other cities such as Leipzig, Cologne, Breslau, afford quite as remarkable illustrations, and indeed one may say that there is scarcely a large city in modern Europe or the United States which might not serve as an example of the same proposition. If we were to take the populations of the urban areas instead of the political areas, the tables of population, as ordinarily constructed, would be radically changed, and the order of size would be reversed in very many cases.

It is a mere corollary of this proposition that all these tables show very misleading comparisons as to the relative rate of growth, and as to the relative density of the population. Thus, if we compare the population of Chicago in 1880 and 1890 as given in the ordinary tables, we find that it increased from 503,185 to 1,099,850. This seems to be a

most astonishing growth, a rate of 118 per cent in ten years, and although the city, within the limits of 1880, had a remarkable growth in the subsequent ten years it was far from being so great as these figures would indicate. When we turn to the table showing the increase in the area of the city of Chicago between these two years, we find that the area was increased from 35.662 square miles to 174.554 square miles, an increase of nearly 400 per cent. The greatest increase of population occurred in the annexed area. It had some population in 1880, and the growth of the city as reported was therefore much greater than the growth of population with the limits of 1880.\* A still more striking case is afforded by the city of Philadelphia, which, in the year 1850, had a population, according to the census returns, of 121,376, and in 1860, ten years later, a population of 565,529, an increase of over 300 per cent in the limits of one decade. Surely a marvelous rate of progress for a city of over 100,000 population to make. A glance at the table of areas, however, shows that the area was increased from a little over two square miles in 1850 to something over 129 in 1860, an increase of nearly 6500 per cent in area. These annexed areas had already in 1850 a population of 285,396 and annexation without growth accounts for the chief increase in the population of the city during that decade. The same thing is true of European cities. Cologne, for example, increased its population from 144,772 in 1880 to 281,681 in 1890, a marvelous rate of increase for such an old city, to be explained largely by the fact that it increased its area from 770 hectares to over 11,000 hectares, most of the annexed territory containing a fairly dense population. Leipzig showed a population of 149,081 in 1880

\*The population in 1880 of the annexed areas is not ascertainable. It included the townships of Hyde Park, Jefferson, Lake and Lakeview, with a population of 45,537 in 1880, also a part of Cicero township, whose aggregate population in 1880 was 5,182, and part of Calumet township whose total population in 1880 was 2,576. As several villages in the two last named townships which were not incorporated in Chicago had, in 1880, a population of 4,872, it is obvious that the population of the annexed district in 1880 fell short of 50,000 persons, while in 1890 it was nearly or quite 300,000.

and of 400,000 in round numbers in 1896; truly a remarkable increase, largely explained, however, by the increase in area from 1640 hectares in 1880 to 5770 in 1896, nearly all of the annexed territory being fairly densely populated.

It follows as a matter of course that all figures in regard to density of population, or the relative rate of increase of density of population, are also untrustworthy and misleading as given in ordinary tables. Thus in the tables constructed by Dr. Sedlaczek, we find that from 1881 to 1890 the population of Chicago increased at a rate of 60,000 per year in round numbers, while in the decade from 1871 to 1880 its increase was only a little over 20,000 per year. This would seem to imply a remarkable rate of increase in the decade from 1881 to 1890 as compared with 1871 to 1880. It is as above stated to be explained in part by the incorporation of fairly well populated territory. The city of Paris showed an increase of 64,288 per year in the decade from 1852 to 1861, and only 15,565 in the decade from 1862 to 1871, which would seem to imply a great falling off in the rate of progress. It is to be explained, however, by the fact that in the decade from 1850 to 1860 Paris increased its area from 3438 hectares to 7802, while it made no increase in the decade 1860-1870. In the same way the city of Manchester showed an average yearly addition to the population of 16,389 from 1882 to 1891, and an actual decrease of 977 per year in the decade from 1872 to 1881. Any deductions from this fact that the city of Manchester was declining in the decade 1871-1880, while it showed a remarkable reversal of its tendencies in the decade 1881-1890, will be of course misleading in the highest degree. As a matter of fact the population of the city of Manchester, as a political unit, decreased, owing to the removal of people from the business portion of the city to the suburban or residence portion. It increased at such a large rate in the decade from 1882 to 1891, among other reasons, because the area was increased from 1737 hectares to 5175.

The population of Liverpool decreased absolutely between 1881 and 1891, declining from 552,508 in the former year to 517,980 in the latter, a decrease of over 6 per cent, and yet this decade was one of marked growth and prosperity in the city. The explanation is again the same. The city, in a political sense comprising less than nine square miles, is only the nucleus of the real city and like so many other "city" or business districts, actually declined in population owing to the removal of residences from the heart of the city to the outer rings. The rapid increase from 1831 to 1841 (165,000 to 286,487) is to be explained, on the contrary, by the enlargement of the city territory from 752 to 2108 hectares.

That experts as well as laymen need to keep these things in mind is shown by the use which Noel A. Humphreys makes of population tables\* where he compares the growth of Chicago and Liverpool as if the figures given in the census meant anything for such a comparison.

The above considerations are sufficient to demonstrate that our tables as at present constituted are for purposes of social, economic, and industrial investigation, likely to be the source of much confusion and error unless used with great care.

If we are going to make, therefore, any comparative studies in the growth of great cities, we must reconstruct our tables and base them upon some unit which will correspond to the unit of our investigation, whatever that may be. If we desire to utilize these facts for deductions as to facts and policies in social, industrial, and economic matters, we must strive in some way to obtain an urban unit in each case which will correspond to the social, industrial, and economic unit of which we are speaking, and with which we have to do. To put the case in another way, we must

\* "Results of the Recent Census and Estimates of Population in the Largest English Towns," *Journal of the Royal Statistical Society*, June, 1891, Vol. liv, p. 311 et seq.

seek a common denominator for our comparisons, if these comparisons are to be of any assistance for theoretical or practical purposes. Now there are many serious difficulties in the way of obtaining such a common denominator, a common unit of comparison, and these difficulties are partly theoretical and partly practical, and both are equally serious. In the first place, it is by no means easy to determine in any individual case even, to say nothing of a large number of cases, what we should include within the urban unit.\* How far shall the radius extend from the centre of one of these agglomerations or aggregations of people so as to include all that ought to be included as a part of the urban aggregate, and exclude what does not belong to it? Various attempts have been made to answer this question, with greater or less success, but all of them based in the last analysis upon a more or less arbitrary assignment of bounds, and consequently upon an assignment which one finds more or less difficult to justify.

Dr. Ernst Hasse has endeavored † to find such a common denominator for German cities. He attempts to draw a distinction by constituting three circles; first, the real city, being the nucleus of the metropolitan aggregation, which is also, generally speaking, the political unit. Second, the city with those suburbs which form a real part of the urban agglomeration. Third, the city with its outlying dependencies, which although dependent in many respects for their life upon the existence of the city, do not really form a part of the urban agglomeration. Now it is evident that the opinions of no two people would probably agree in any individual case as to where such circles ought to be drawn, and consequently in attempting to set such boundaries to the different cities there would be the greatest room for arbitrary designation of boundaries. Indeed Dr. Hasse

\* See "Reports of the Tenth Census" (1880), volume on Population, p. xxviii; also "Report on Social Statistics of Cities," Vol. i, p. 531.

† In Mayr's *Allgemeines Statistisches Archiv*, Vol. ii, 1891-92, pp. 16 et seq., in the article on the "Density of Metropolitan Populations."

makes little or no use of this division, but proceeds to an entirely different principle as the basis of his extremely interesting comparisons, namely, that the urban unit is to be determined by the fact of density of population, that this is really at bottom the sole test, and that beginning at the centre of the population aggregate, we should include the area in concentric rings until we have reached a point at which the average density of population in the last ring falls to the average density of population (excluding the urban unit) in the larger district of which the city forms a part, such as county, province, state, etc. Thus if we take the province of lower Austria excluding Vienna, we find that the average population is fifty-nine persons per square kilometer. Now the average density of the tenth kilometric ring, counting from the centre of the city of Vienna, is far above this, and probably we should have to proceed to, say the fifteenth kilometric ring, before the average density of population would sink to the average of the province, excluding the metropolis, in which case the first fourteen kilometric rings, counting from the centre, would constitute the urban district of Vienna. This method of determining the urban area has the advantage of resting upon at least one sound characteristic of urban populations, and although the defects are apparent, perhaps it is as good a method as we have.

Dr. N. Brückner \* adopts another system which at bottom is nothing more than accepting the opinion of the officials in the different cities as to what constitutes the real economic unit of their respective cities. This is of course practically taking in each individual case the arbitrary opinion of the statistical office of the various cities instead of trying to base the estimates upon any common principle.

It has been proposed to take as the urban unit the territory

\* In two articles upon the "Development of Metropolitan Population in the German Empire," published in Mayr's, *Allgemeines Statistisches Archiv*, Vol. i, 1890, p. 134 et seq., and 614 et seq. Somewhat similar are calculations of Dr. G. L. Matzsch, in his work, "*Die Bewegung des Bevölkerungsstandes im Königreich Sachsen während der Jahre 1871-1890*," pp. 22, et seq.



around such an aggregate of population, which with a reasonably dense population, has shown a tendency to increase in population at a certain constant rate. Thus the area about London, to which the term the Greater London is sometimes given, including what is known as the Metropolitan Police District, was in 1801 fairly densely populated. In the next forty years it doubled its population, and in the next forty years doubled it again; and if we take the outer ring of this region, it increased by almost exactly 50 per cent from 1871 to 1881, and again from 1881 to 1891. The rate of increase of Registration London during a series of eighty years, was remarkably uniform, varying per decade between 17.28 and 21.9 per cent. Registration London, therefore, or the Metropolitan District taken by the Registrar General as included within the metropolis in 1851, shows from this point of view an approximation to what might be called the metropolitan unit.

Certainly we cannot say that up to the present any very satisfactory method has been found of determining what ought to be considered as the urban unit, and we shall see in the subsequent investigation that this is reflected in all the tables, statistical and otherwise, relating to the growth and development of our great cities.

Another real difficulty in the way of intelligent comparison of great cities in the matter of population is to be found in the lack of facts relating to the real population of different districts at different periods. Thus, owing to the shifting of census areas at different times, it becomes impossible to get the exact population of a given area for a long series of years. This is strikingly illustrated in our American cities, particularly in those cities which have added largely to their population and to their areas. Thus in Chicago, for example, where the population of the city has been taken at various times by wards, it is almost impossible to ascertain for any single ward in the city the population at different census periods, owing to the continual shifting of ward boundaries.

Thus when a township or a portion of a township has been annexed to the city it appears in the new census as a part of a given ward; it appeared in the old census as a part of a given township, and in neither case is the population given specifically for the particular area in question. Of course this is a kind of error which it is impossible to make good where the original material of the census has been destroyed, or where in the original material the units taken in one census cannot be in any way made harmonious or co-terminous with the units of the following census. In a few cases the census units have been preserved through a long period. This is true in the case of many of the European cities. In Leipzig, for instance, the population has been taken by *gemeinden*; in London,\* many of the censuses, by parishes. The boundaries of these *gemeinden* having remained the same from the beginning, it becomes possible to compare the actual growth within a given area from decade to decade. R. Price Williams declares, however, that even in the case of London it is difficult to trace with any detail the various changes which have occurred in the population of the different districts of the metropolis prior to 1841; owing partly to the scanty information afforded in the earlier census returns, and also to the extensive alterations in the arrangement and grouping of the different sub-districts in the censuses of 1871 and 1881. It will be difficult indeed to secure the basis for comparative study of the past history of these great cities, so far as it is dependent upon this circumstance. The only remedy is to try in the various countries to get the census departments to adopt units for the future which may be kept permanent, or the identity of which can be traced in subsequent periods.

In comparing the areas of great cities, we find a further difficulty in the lack of definite and trustworthy topographical surveys. Mr. Price Williams, in the article referred to, calls

\*R. Price Williams, "The Population of London from 1801 to 1881." *Journal of the Royal Statistical Society*. Vol. xlviii(1885), p. 349.

attention to this fact in regard to London, and notes that the area of Registration London has been given differently in all four censuses from 1851 to 1881. The following table shows the figures:

TOTAL AREA OF REGISTRATION LONDON.

	1851.	1861.	1871.	1881.
	Acres.	Acres.	Acres.	Acres.
Area, including water . . .	78,029	77,997	75,362	75,334
Area, excluding water . . .	75,260	75,219	74,445	74,427

The actual boundaries of Registration London have remained the same, but, owing to errors in computation of areas, the total number of acres given at different times differs considerably. It will be seen that there is a difference of over 2000 acres between the census of 1851 and 1881, the difference being entirely due to incorrect measurements. It was not until the census of 1881 that full advantage was taken by the Census Department of the ordinance survey maps of the city of London. Even now the different authorities give different areas for the same district. Thus, Price Williams gives the area of Registration London in 1891 as 74,427 acres excluding water, or 75,334 including water. Whitaker's almanac gives 74,692 for the same area. The area of the different cities in Germany is being steadily computed with more exactness. Thus in the single year, 1891-92, the area of the city of Breslau was increased by 58.56 acres, as a consequence of new surveys and correction of errors in computation. The reports of the area of different cities are based partly upon a full catastral survey, and partly upon planimetric measurement. The statement is made on good authority\* that very few of the German cities have such accurate surveys as enable them to determine the boundaries and the area of each portion of the city territory,

\* "Statistisches Jahrbuch deutscher Städte," Vol. iii, 1893, p. 1.

and that this is true is indicated by the number of corrections made in the areas of the cities during the years 1891-1898. No two tables of the areas of the German cities correspond exactly. Thus in regard to Berlin,\* it is stated that the area given in the table is based upon the tax levy tables for the year 1890-91, and differs from the same area for the preceding year by one hectare, eight ares and eighty-five square meters; while the area of the city, as stated in the report of the statistical bureau of the preliminary results of the census of December 1, 1890, is given as 6453 hectares, instead of 6338, a difference of 275 acres. It is further stated that the reason for this very considerable difference will be found only when the new survey of the city area is completed, which will not be for several years. In the report for 1897, in a list of some fifty-five cities, no fewer than nineteen corrections are made in the area as given in the preceding year, these corrections being rendered necessary by the discovery of wrong computations or by the completion of more accurate surveys. Many of the German cities are engaged in making accurate surveys of the entire area of the city. Thus the city of Munich made an appropriation of some \$60,000 to pay its share of the expense, the state government also bearing a portion. Berlin has been carrying on such a survey for over twenty years past, beginning in 1876. Up to 1893-94 it had surveyed a little over 5000 hectares out of a total area of 6339, and at a cost up to that time of nearly \$350,000.

No effort has been made so far as is known on the part of any American city to carry out a survey in this sense of the territory included within its boundaries, all our areas being computed upon the basis of maps based upon more or less accurate general surveys. It will be seen, therefore, that in subsequent computations there is an error of more or less importance arising out of the uncertainty as to the actual area of the cities concerned.

\* Ibid., p. 18.

It is stated on official authority \* that "no information exists as to areas in the city of Boston sufficiently accurate to be worth publishing." When the commission began its work it found that the list of real estate owned by the city as published by one department did not correspond at all with the statement as made by another. In one such list discrepancies existed in four cases out of every ten. No compilation of the area of the city by wards existed, and no two computations of the city area agreed. What is true of Boston is practically true of the other leading American cities.

There is the same difficulty in tables of population and areas for different countries as for the cities.†

The same thing is true of areas in general in the United States. Thus the area of Long Island, New York, varies, according to different authorities, from 1007 square miles to 1682 square miles, or over 50 per cent of the lower estimate. The measured area of Long Island on the coast survey charts is given at 1353.8 square miles, while the area accepted in the Census Bulletin of 1890 is 1007.‡

The discrepancies in the tables printed in the census of 1890 throw a suspicion upon the correctness of the work at many points. Thus the area of St. Louis is given at one place in the reports as 48, at another as 61 square miles; San Francisco as 50 and 15; New Orleans as 187 and 37; Holyoke as 4 and 18. These figures are evidently based on different units, but no explanation is offered as to their lack of agreement.§

The areas of the United States, of the states and territories and of the counties and parishes at the date of the eleventh

\*The First Annual Report of the Department of Municipal Statistics of the City of Boston, January 31, 1898, p. 5.

†Levasseur, "Area and Population of Leading Countries," *Journal of the Royal Statistical Society*, January, 1892. Vol. li, p. 298 et seq.

‡See Walter F. Wilcox, "Area and Population of the United States at the Eleventh Census." *American Economic Studies*, Vol. ii, No. 4, p. 224. *American Economic Association*, August, 1897.

§ *Ibid.*, p. 227.

census are stated in Census Bulletin No. 23, dated January 21, 1891, and prepared primarily for the use of the Census Office. The area of each city of over 10,000 inhabitants was asked of the city authorities and published in Census Bulletin No. 100 on the "Social Statistics of Cities." Where cities and counties coincide we have two independent measurements, and in general they do not agree at all. \*

Another serious difficulty in the way of securing an accurate basis, or even an approximately satisfactory basis for such comparisons of urban phenomena is to be found in the fact that even where the census has been taken with regularity in many cases, it has been taken for some specific purpose, and therefore in some particular way, and city authorities have been unwilling to take the trouble of extracting from the mass of information which they have that particular information which is necessary for this sort of work. Thus the surveyor of the city of Baltimore writes that it would be impossible to get the information relative to the progressive additions to the territory of Baltimore from the beginning. Doubtless the full information in regard to such annexation, and additions is to be found in the surveyor's office, but kept probably in such a defective way as to make it impossible to ascertain it exactly without, as he says, some trouble. Dr. Hasse, in the article before referred to, relating to the density of metropolitan populations, says that he was compelled to send special circulars and blanks to the various statistical offices in Europe, which they filled out with more or less accuracy and promptness, but which some authorities declined to fill out on the ground that it would take entirely too much time and too much labor, indicating that their records were not kept in a way which enabled them to answer fundamental questions in a satisfactory way within a reasonable time. Generally speaking, data collected by our American cities have been either so untrustworthy, so inadequate, or have been kept in such a

\* *Ibid.*, p. 216.

careless way that the value of their returns is very far inferior to that of continental urban authorities, particularly French and German. The English returns, though perhaps more accurate, are not much more satisfactory than our own, since they fail to collect at many points the information which is needed. In fact one may say that the data concerning the life of great cities are perhaps nowhere adequately collected. They are best collected however in those places where the city supports a statistical bureau whose special function it is to collect statistics concerning the life of the city in various directions.

There is another consideration which ought not to be lost sight of in the study of this and similar problems, and that is that in order to get a fairly adequate idea of the real facts concerning any one of these prominent aspects of urban life, any particular fact should be studied from a number of different view points. The population of a given city, for example, should be compared with the population of other cities, the density of population with the density of population of other cities, the area with the area of other cities; the population in different concentric areas should be compared; the density of population with that of the larger units, such as counties or provinces; the population, as far as possible, with that of the outlying districts, and many other similar facts, in order to avoid erroneous conclusions that might be deduced from a single table or a single set of tables.

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